

QUALITY CONTROL REPORTS FOR
SEMI DENSE BITUMINOUS CONCRETE



CIVIL-TECH CONSULTANTS AND ENGINEERS

Building & Highway Material Testing Laboratory

NABL - Accredited Laboratory as per ISO / IEC-17025 :2005



Job No.: CTCE/BBMP/W.No.08/MSM/CSR-04/003i/QB(SDBC)/2016-17

17.05.2016

TEST REPORT ON DETERMINATION OF BITUMEN CHARACTERISTICS

*CUSTOMER	:	Asst. Executive Engineer, Kodigehalli Sub Division, BBMP, Bangalore.
*AGENCY	:	Mr . M. Srinivasa Murthy #17, Jyothi gas godown, 6 th cross, Kurubarahalli, Bangalore-86
*NAME OF THE WORK	:	Improvements to Roads and Drains at TATA nagara Surroundings in Ward No.08, Kodigehalli Sub Division BBMP, Bangalore.
REFERENCE	:	AEE(KSB)/PR/16-17 Dated: 19.05.2016
* SAMPLE ID	:	Bitumen
DATE OF SAMPLING	:	16.05.2016
DATE OF TESTING	:	17.05.2016



The results of the tests conducted on the bitumen sample.

Sl. No	Description	Test Method as per IS	Test Result	Requirement as per IS:73:2013
1	Penetration at 25 °C, 1/10 mm	IS :1203 -1978 (RA-2009)	63	60 to 70
2	Softening point, °C	IS :1205 -1978 (RA-2009)	46	Min. 45
3	Ductility at 27°C, cm	IS :1208 -1978 (RA-2009)	100 >	Min. 50
4	Flash Point, °C	IS :1209 -1978 (RA-2009)	286	Min. 220

*Information is furnished by the Customer/Representative.

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Job No.: CTCE/BBMP/W.No.08/MSM/SDBC/AIV/2016-17

17.05.2016

Aggregate Impact Value

IS: 2386 Part IV

Customer	Asst. Executive Engineer, Kodigehalli Sub Division, BBMP, Bangalore.
Agency	Mr . M. Srinivasa Murthy #17, Jyothi gas godown, 6th cross, Kurubarahalli, Bangalore-86
Name of the Work	Improvements to Roads and Drains at TATA nagara Surroundings in Ward No.08, Kodigehalli Sub Division BBMP, Bangalore.
Reference	AEE(KSB)/PR/16-17 Dated: 19.05.2016
Source / Location	Hot Mix Plant, Bangalore
Type of Mix	Semi Dense Bituminous Concrete
Date of Testing	17.05.2016



Sl No.	Details	Trial No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	375	378	20.85
2	Weight of aggregate passing 2.36 mm sieve after the test = W_2 g	76	81	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	299	297	
4	Aggregate Impact value = percent fines $100 * (W_2 / W_1) \%$	20.27	21.43	

Comments:

→ Maximum allowable Aggregate Impact value for Semi Dense Bituminous Concrete is 27%

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17.05.2016

Aggregate Impact Value

IS: 2386 Part IV

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Reference	AEE(KSB)/PR/16-17 Dated: 19.05.2016
Source / Location	Hot Mix Plant, Bangalore
Type of Mix	Semi Dense Bituminous Concrete
Date of Testing	17.05.2016



Sl No.	Details	Trial No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	379	382	21.55
2	Weight of aggregate passing 2.36 mm sieve after the test = W_2 g	80	84	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	299	298	
4	Aggregate Impact value = percent fines $100 * (W_2 / W_1) \%$	21.11	21.99	

Comments:

→ Maximum allowable Aggregate Impact value for Semi Dense Bituminous Concrete is 27%

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19.05.2016

Specific Gravity And Water Absorption Test

IS: 2386 Part III

Client	Asst. Executive Engineer, Kodigehalli Sub Division, BBMP, Bangalore.
Agency	Mr. M. Srinivasa Murthy #17, Jyothi gas godown, 6th cross, Kurubarahalli, Bangalore-86
Name of the Work	Improvements to Roads and Drains at TATA nagara Surroundings in Ward No.08, Kodigehalli Sub Division BBMP, Bangalore.
Reference	AEE(KSB)/PR/16-17 Dated: 19.05.2016
Type of Mix	Semi Dense Bituminous Concrete
Source / Location	Hotmix Plant, Bangalore
Date of Testing	19.05.2016



Sl. No.	Details	Notation	Test Number			Mean Value
			Test 1	Test 2	Test 3	
1	Weight of aggregate suspended in water with the basket	$W_1 g$	2013	2015	2015	
2	Weight of basket suspended in water	$W_2 g$	755	755	755	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_s g$	1258	1260	1260	
4	Weight of saturated surface dry aggregate in air	$W_3 g$	2007	2011	2014	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_s) g$	749	751	754	
6	Weight of oven dried aggregate	$W_4 g$	1995	1998	1999	
7	Specific Gravity	$W_4 / (W_3 - W_s)$	2.664	2.660	2.651	2.658
8	Apparent Specific gravity	$W_4 / (W_4 - W_s)$	2.707	2.707	2.705	2.706
9	Water Absorption	$((W_3 - W_4) * 100) / W_4$	0.60%	0.65%	0.75%	0.67%

Comments:

→ Maximum allowable Aggregate Water absorption value for Semi Dense Bituminous Concrete is 2.0%

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Job No.: CTCE/BBMP/W.No.08/MSM/SDBC/Shape_T/2016-17

17.05.2016

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	Asst. Executive Engineer, Kodigehalli Sub Division, BBMP, Bangalore.
Agency	Mr . M. Srinivasa Murthy #17, Jyothi gas godown, 6th cross, Kurubarahalli, Bangalore-86
Name of Work	Improvements to Roads and Drains at TATA nagara Surroundings in Ward No.08, Kodigehalli Sub Division BBMP, Bangalore.
Reference	AEE(KSB)/PR/16-17 Dated: 19.05.2016
Technical Reference	IS 2386(Part 1) 1963 (RA 2007)
Type of Mix	Semi Dense Bituminous Concrete
Date of Testing	17.05.2016



Result : Flakiness Index = 11.45%

Elongation Index = 13.10%

Result : Combined Flakiness & Elongation index

24.55%



Comments:

→ Maximum allowable Flakiness & Elongation Index for Semi Dense Bituminous Concrete is 30%

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17.05.2016

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	Asst. Executive Engineer, Kodigehalli Sub Division, BBMP, Bangalore.
Agency	Mr . M. Srinivasa Murthy #17, Jyothi gas godown, 6th cross, Kurubarahalli, Bangalore-86
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Reference	AEE(KSB)/PR/16-17 Dated: 19.05.2016
Technical Reference	IS 2386(Part 1) 1963 (RA 2007)
Type of Mix	Semi Dense Bituminous Concrete
Date of Testing	17.05.2016



Result : Flakiness Index = 12.10%

Elongation Index = 13.85%

Result : Combined Flakiness & Elongation index

25.95%



Comments:

→ Maximum allowable Flakiness & Elongation Index for Semi Dense Bituminous Concrete is 30%

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Job No.: CTCE/BBMP/W.No.08/MSM/SDBC/Stripping/2016-17

19.05.2016

Stripping Value of Road Aggregates (Static Immersion Test)

IS: 6241

Client	Asst. Executive Engineer, Kodigehalli Sub Division, BBMP, Bangalore.
Agency	Mr . M. Srinivasa Murthy #17, Jyothi gas godown, 6th cross, Kurubarahalli, Bangalore-86
Name of the work	Improvements to Roads and Drains at TATA nagara Surroundings in Ward No.08, Kodigehalli Sub Division BBMP, Bangalore.
Reference	AEE(KSB)/PR/16-17 Dated: 19.05.2016
Type of Mix	Semi Dense Bituminous Concrete
Date of Testing	19.05.2016



Type of binder : 60/70
Percentage of binder used : 5.0% by wt.
Total weight of aggregate : 200 g
Total weight of binder : 10.0 g
Temperature of water-bath : 40° C

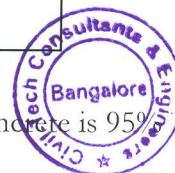
Observation Number	Stripping, Percentage	Average, Percentage	Average Retained Coating, %
1	3.1	3.20	96.80
2	3.2		
3	3.3		

Comments:

→ Minimum allowable Aggregate retained coating for Semi Dense Bituminous Concrete is 95%

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19.05.2016

BITUMEN CONTENT DETERMINATION OF SEMI DENSE BITUMINOUS CONCRETE MIX

AS per IRC : SP : 11 - 1984

CLIENT	Asst. Executive Engineer, Kodigehalli Sub Division, BBMP, Bangalore.
AGENCY	Mr . M. Srinivasa Murthy #17, Jyothi gas godown, 6th cross, Kurubarahalli, Bangalore-86
NAME OF THE WORK	Improvements to Roads and Drains at TATA nagara Surroundings in Ward No.08, Kodigehalli Sub Division BBMP, Bangalore.
REFERENCE	AEE(KSB)/PR/16-17 Dated: 19.05.2016
SAMPLE I/D	Roads at TATA nagara Surroundings in Ward No.08
DATE OF TESTING	19.05.2016



BITUMEN CONTENT DETERMINATION

Description	Trail 1	Trail 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	474	475
3. Weight of Asphalt and Mineral matter Extracted, g	-	-
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g		
6. Weight of Bitumen Extracted, g. (corrected)	26.00	25.00
7. Bitumen content in %	5.20	5.00
8. Average	5.10	

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Handwritten signature/initials in blue ink.

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19.05.2016

BITUMEN GRADATION DETERMINATION OF SEMI DENSE BITUMINOUS CONCRETE MIX

As per IS : 2386 and IRC : SP : 11 - 1984

CLIENT	Asst. Executive Engineer, Kodigehalli Sub Division, BBMP, Bangalore.
AGENCY	Mr . M. Srinivasa Murthy #17, Jyothi gas godown, 6th cross, Kurubarahalli, Bangalore-86
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REFERENCE	AEE(KSB)/PR/16-17 Dated: 19.05.2016
SAMPLE I/D	Roads at TATA nagara Surroundings in Ward No.08
DATE OF TESTING	19.05.2016



GRADATION AFTER EXTRACTION

Sieve Size in mm	Trail 1				Specified Limits as per MORTH specification table 500-15 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
13.2	0	0	0	100	100
9.5	26.35	5.56	5.56	94.44	90-100
4.75	257.48	54.32	59.88	40.12	35-51
2.36	62.38	13.16	73.04	26.96	24-39
1.18	46.12	9.73	82.77	17.23	15-30
0.3	27.95	5.90	88.67	11.33	9-19
0.075	31.02	6.54	95.21	4.79	3-8

AE-8

Sieve Size in mm	Trail 2				Specified Limits as per MORTH specification table 500-15 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
13.2	0	0	0	100	100
9.5	28.15	5.93	5.93	94.07	90-100
4.75	265.49	55.89	61.82	38.18	35-51
2.36	55.32	11.65	73.47	26.53	24-39
1.18	32.69	6.88	80.35	19.65	15-30
0.3	28.15	5.93	86.27	13.73	9-19
0.075	35.64	7.50	93.78	6.22	3-8

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19.05.2016

Aggregate Gradation Test

IS : 2386 Part I

Client	Asst. Executive Engineer, Kodigehalli Sub Division, BBMP, Bangalore.
Agency	Mr . M. Srinivasa Murthy #17, Jyothi gas godown, 6th cross, Kurubarahalli, Bangalore-86
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Reference	AEE(KSB)/PR/16-17 Dated: 19.05.2016
Sample I / D	Hot Mix Plant, Bangalore
Type of Mix	Semi Dense Bituminous Concrete (SDBC)
Date of Testing	19.05.2016



Total Weight of Sample: 5600 gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Grade-II As per MORTH	Remarks
13.2	0	0.0	0	100	100	Gradation satisfies Grade-II MORTH specification
9.5	488	8.7	8.71	91.29	90-100	
4.75	2960	52.9	61.57	38.43	35-51	
2.36	715	12.8	74.34	25.66	24-39	
1.18	465	8.3	82.64	17.36	15-30	
0.3	390	7.0	89.61	10.39	9-19	
0.075	315	5.6	95.23	4.77	3-8	

Total Weight of Sample: 5550 gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Grade-II As per MORTH	Remarks
13.2	0	0.0	0	100	100	Gradation satisfies Grade-II MORTH specification
9.5	470	8.5	8.47	91.53	90-100	
4.75	2850	51.4	59.82	40.18	35-51	
2.36	760	13.7	73.51	26.49	24-39	
1.18	420	7.6	81.08	18.92	15-30	
0.3	435	7.8	88.92	11.08	9-19	
0.075	320	5.8	94.68	5.32	3-8	

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